ASRS Program Briefing

2016

Aviation Safety Reporting System

ASRS

NASA

ASRS Program Briefing Index

ASRS Program Overview

Concept & Mission

The Aviation Safety Reporting System (ASRS) receives, processes and analyzes voluntarily submitted incident reports from pilots, air traffic controllers, dispatchers, cabin crew, maintenance technicians, and others. Reports submitted to ASRS may describe both unsafe occurrences and hazardous situations. Information is gathered from these reports and disseminated to stakeholders. ASRS's particular concern is the quality of human performance in the National Airspace System.

Reporting Incentives

VOLUNTARY

CONFIDENTIAL

NON-PUNITIVE
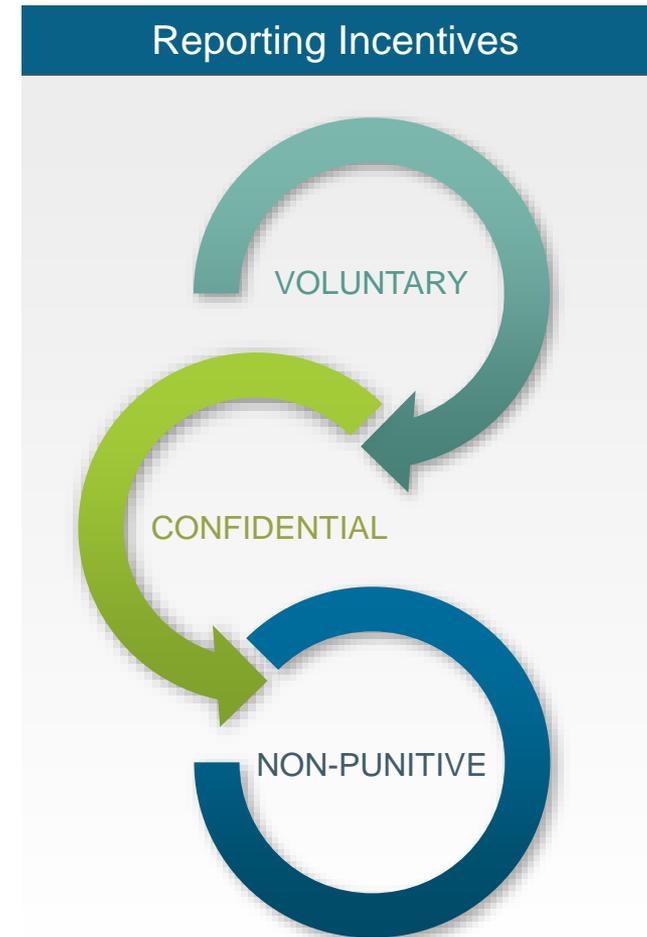
Purpose

- **Identify deficiencies and discrepancies in the National Airspace System**

  - Objective: Improve the current aviation system

- **Provide data for planning and improvements to the future National Airspace System**

  - Objective: Enhance the basis for human factors research and recommendations for future aviation procedures, operations, facilities, and equipment

ASRS Background

WW II	Industry and Military recognized value of voluntary incident reporting
1958	Need for U.S. Incident Data System raised during FAA Enactment Hearings
Oct. 1974	United Airlines incident foreshadowed TWA 514 Accident
Dec. 1974	TWA 514 Accident
Apr. 1975	Study of the National Air Transportation System as a Result of the Secretary's Task Force on the FAA Safety Mission
May 1975	Aviation Safety Reporting Program (ASRP) Implemented (FAA)
May 9, 1975	Advisory Circular 00-46A Issued
Apr. 1976	Aviation Safety Reporting System (ASRS) Established (NASA/FAA)

ASRS Staff

The ASRS Staff is composed of highly experienced pilots, air traffic controllers and mechanics, as well as a management team that possess aviation and human factors experience. ASRS Analysts' experience is comprised of over 600 cumulative years of aviation expertise covering the full spectrum of aviation activity: air carrier, corporate, military, and general aviation; Air Traffic Control in Towers, TRACONs, Centers, and Military Facilities. Analyst cumulative flight time exceeds 200,000 hours in over 50 different aircraft.

In addition, the ASRS Staff has human factors and psychology research experience in areas such as training, fatigue, crew resource management, user interface design, usability evaluations, and research methodology.

Documents Governing ASRS Immunity & Confidentiality

- Federal Register Notice, 1975 & 1976

- Federal Aviation Regulations Part 91.25 (14 CFR 91.25)

- FAA Advisory Circular 00-46E

- FAA policy concerning Air Traffic Controllers regarding ASRS reporting, FAA Order JO 7200.20

The Immunity Concept

Paragraph 9. c. FAA Advisory Circular No. 00-46E

C. **Enforcement Restrictions**. The FAA considers the filing of a report with NASA concerning an incident or occurrence involving a violation of 49 U.S.C. subtitle VII or the 14 CFR to be indicative of a constructive attitude. Such an attitude will tend to prevent future violations. Accordingly, although a finding of violation may be made, neither a civil penalty nor certificate suspension will be imposed if:

1. The violation was inadvertent and not deliberate;

2. The violation did not involve a criminal offense, accident, or action under 49 U.S.C. § 44709, which discloses a lack of qualification or competency, which is wholly excluded from this policy;

3. The person has not been found in any prior FAA enforcement action to have committed a violation of 49 U.S.C. subtitle VII, or any regulation promulgated there for a period of 5 years prior to the date of occurrence; and

4. The person proves that, within 10 days after the violation, or date when the person became aware or should have been aware of the violation, he or she completed and delivered or mailed a written report of the incident or occurrence to NASA.

ASRS Stakeholders

Report Processing

Report Intake Overview

ASRS receives reports from pilots, air traffic controllers, cabin crew, dispatchers, maintenance technicians, ground personnel and others involved in aviation operations.

ASRS's report intake has been robust from the first days of the program, in which it averaged approximately 400 reports per month. In recent years, report intake has grown at an enormous rate. Intake now averages 1,769 reports per week and more than 7,664 reports per month.

Report Intake Metrics

Monthly Report Intake
### (January 1981 – December 2016)
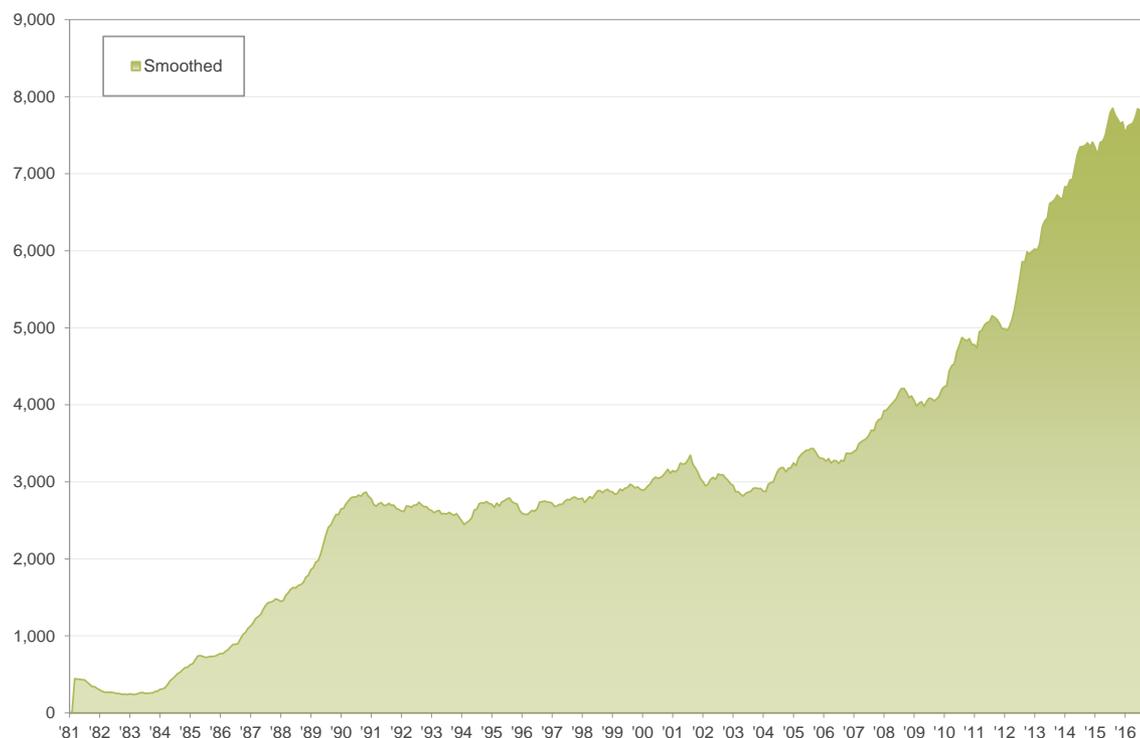
- Total Program Report Intake = **1,432,426**

- Total Report Intake for 2016 = **91,970**

- Nearly 5-fold increase since 1988

- Averaging **7,664** reports per month, **366** per working day

Incident Reporter Distribution

January 2007 – December 2016
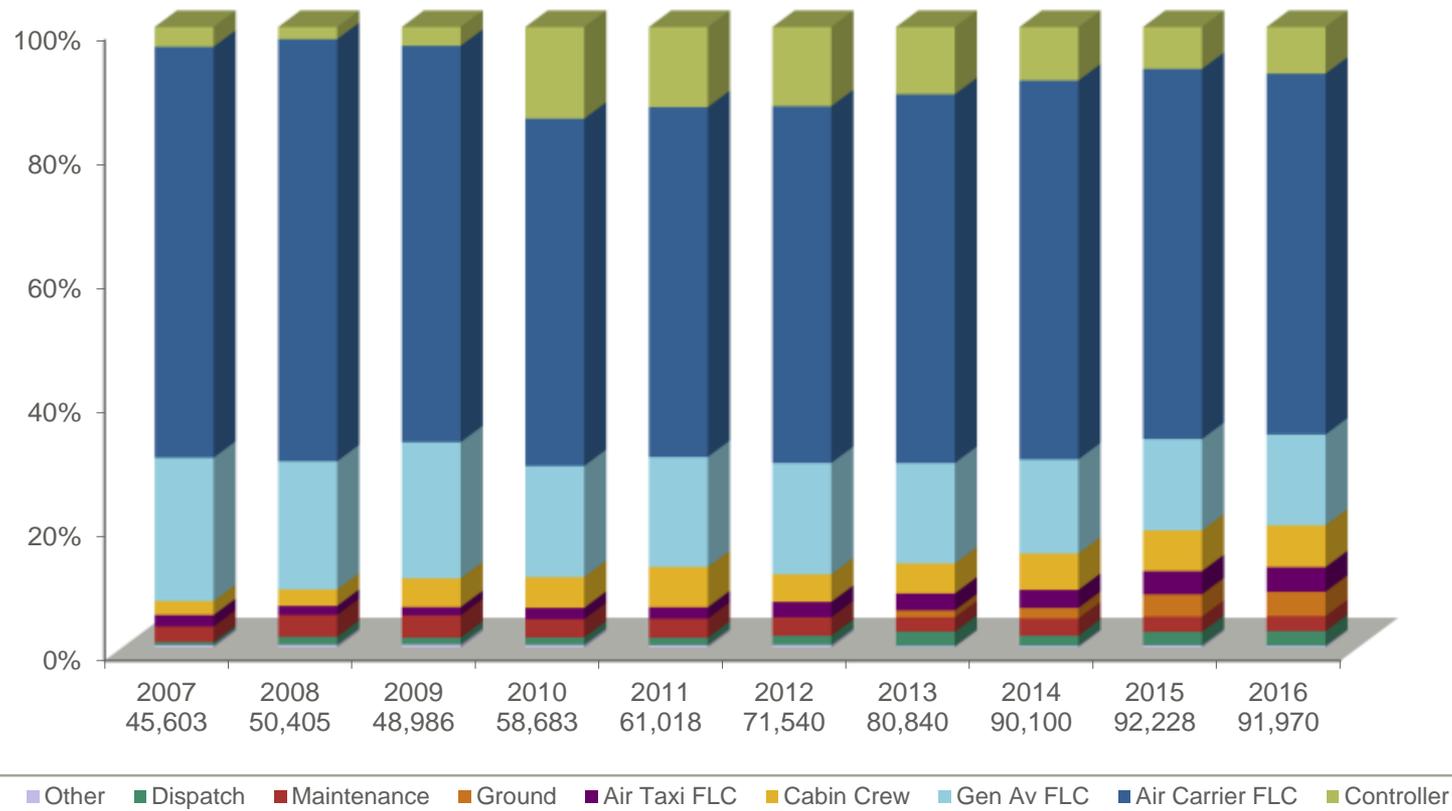
Report Processing Overview

ASRS has securely processed over 1.4 million reports in its 40 year history. The process contains critical elements that ensure each report is handled in a manner that maintains reporter confidentiality while maximizing the ability to accurately assess the safety value of each report. ASRS report processing begins with the receipt of reports through electronic submission or from the post office, and ends with the final coded report entering the ASRS Database.

Reports sent to the ASRS are widely regarded as one of the world's largest sources of information on aviation safety and human factors.

Report Processing Flow
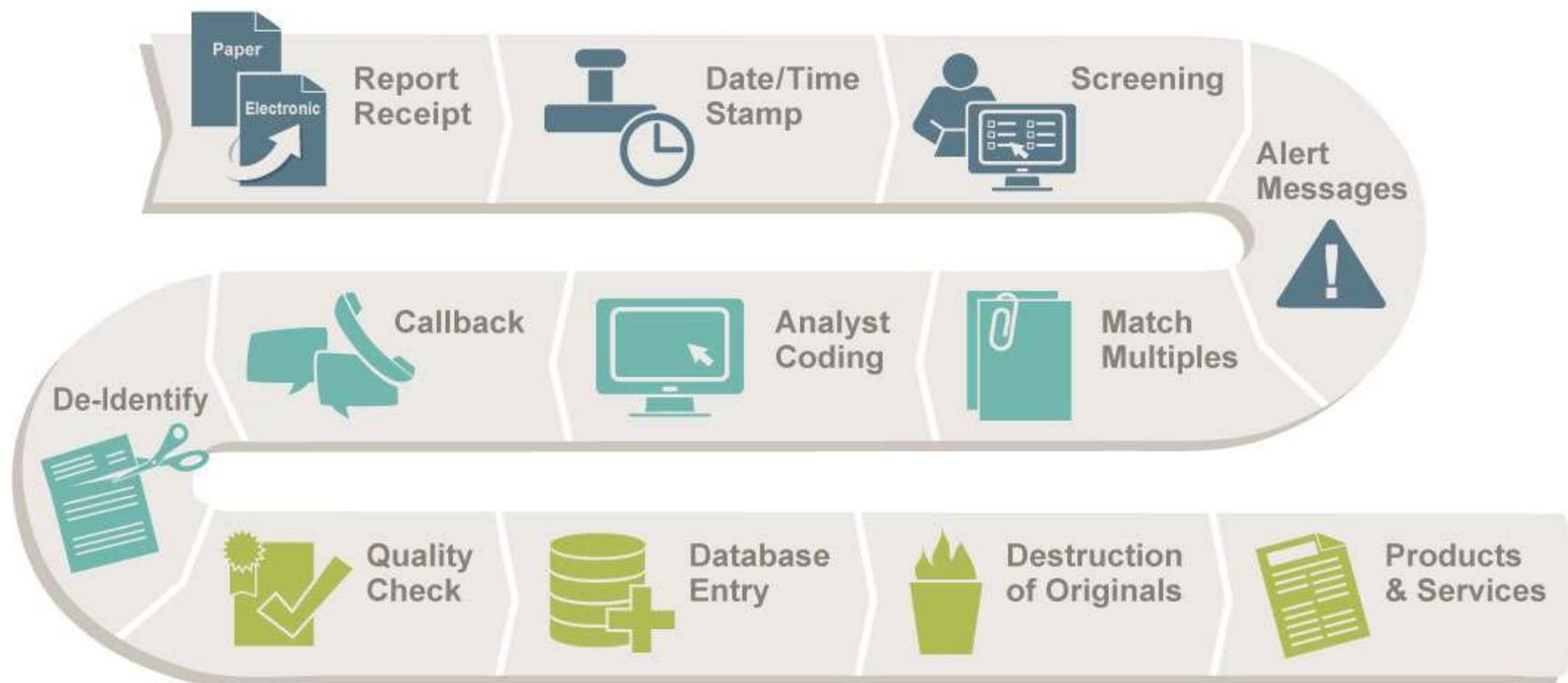
Report Processing Flow
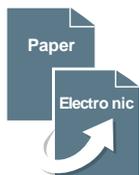
ASRS paper reports are picked-up daily from the Moffett Field Post Office or are received electronically via website Electronic Report Submission (ERS) or ASAP data transmissions

Every report is date and time stamped based on the date of receipt

Two ASRS Analysts "screen" each report within three working days to provide initial categorization and to determine the triage of processing

ASRS Analysts may identify hazardous situations from reports and issue an Alert Message. De-identified information is provided to organizations in positions of authority for further evaluation and potential corrective actions

Report Processing Flow

ASRS retains high-level categorization of 100% of reports received. Based on initial categorization, multiple reports on the same event are brought together to form one database "record"

ASRS Analysts identify reports that require further analysis and entry into the public ASRS database. During the detailed Report Analysis process, reports are codified using the ASRS taxonomy.

An ASRS Analyst may choose to call a reporter on the telephone to clarify any information the reporter provided. This information is added to the analysis and final record.

To ensure confidentiality all identifying data is removed. After analysis, the Identification Strip, the top portion of the report, is returned to the reporter. This ID strip acts as the reporter's proof of submittal. All physical and electronic ID strip data with the reporter's name, address, date and time stamp is removed.

Report Processing Flow

All reports that receive further analysis go through a Final Check to assure coding accuracy. Quality Assurance checks are also performed for coding quality.

Final coded reports enter the ASRS Database. These de-identified records are then available in the ASRS Database Online, which is available through the ASRS website.

Original reports, both physical and electronic data, are destroyed to completely ensure confidentiality

ASRS uses the information it receives to promote aviation safety through a number of products and services, such as Alert Messages, Search Requests, a monthly newsletter, focused studies and more

ASRS Products & Services

Alert Messages
Safety information issued to organizations in positions of authority for evaluation and possible corrective actions.

CALLBACK
Monthly newsletter with a lessons learned format, available via website and email.

Quick Responses
Rapid data analysis by ASRS staff on safety issues with immediate operational importance generally limited to government agencies.

ASRS Directline
Safety topic summaries based on ASRS reports published to meet the needs of operators and flight crews.

ASRS Database
The public ASRS Database Online and data available in Database Report Sets or Search Requests fullfilled by ASRS staff.

Focused Studies/Research
Studies/Research conducted on safety topics of interest in cooperation with aviation organizations.

ASRS Products & Services Metrics

April 1976 – December 2016

Significant Items	Quantity
Incident Reports Received	1,432,426
Safety Alert Messages	6,271
Quick Responses	144
Search Requests	7,521
CALLBACK Issues	443
ASRS Directline Issues	10
Research Studies	64

Aviation Safety Reporting System

21

Alert Messages

Alert Message Overview

When ASRS receives a report describing a hazardous situation, for example, a defective navigation aid, an aircraft system anomaly, a confusing procedure, or any other circumstance which might compromise safe flight – an alerting message is issued using de-identified information provided in the reports.

Alerting messages have a single purpose: to relay safety information to organizations in positions of authority so that they can evaluate the information and take possible corrective actions.

Alert messages are classified as **Alert Bulletins** or **For Your Information Notices**, and may be included in monthly **ASRS Safety Teleconferences**.

ASRS Alerting Pyramid

Alert Bulletins
Time critical safety information issued to organizations in positions of authority for evaluation and possible corrective actions.

For Your Information Notices
Less urgent safety information is issued in For Your Information (FYI) Notices.

ASRS Safety Teleconferences & Other Safety Communications
Alert Bulletins and FYI Notices determined appropriate for an in-depth discussion are included in a monthly teleconference with the FAA and others.

ASRS has no direct authority to directly correct safety issues.
It acts through and with the cooperation of others.

Alerting Subjects

January 2007 – December 2016

Subject	Total
Aircraft Systems	690
Airports Facility Status and Maintenance	458
Other	258
ATC Procedures	220
Airport Lighting and Approach Aids	118
ATC Equipment	113
Hazards to Flight	69
ATC Operations	65
Navigation	41
Aircraft Avionics	35
Aircraft Power Plants	33

Aviation Safety Reporting System

Alerting Responses

January 2007 – December 2016

Response	Percentage
Action taken as a result of the AB/FYI	22%
Action initiated before AB/FYI received	15%
Action initiated in response to AB/FYI but not completed	12%
Issue raised by AB/FYI under investigation	4%
Addressee agrees with AB/FYI but unable to resolve	3%
Addressee disputes factual accuracy of AB/FYI	19%
Information in AB/FYI insufficient for action	13%
Addressee in factual agreement but sees no problem	7%
Action not within addressee's jurisdiction	3%
For information only, no response expected	2%

Total 56%

Examples of Safety Alerting Success

- **Ground Based Bright Light Distraction Events (AB 2016:11)**
FAA (AAS-300) office responded and stated "We are aware of these NASA reports and we believe the situation has since been mitigated. There are actually two separate high intensity signs that are off airport (North & East of the airfield perimeter) which have been the subject of pilot complaints. In both instances the airport has successfully engaged the owners of the signs to reduce the intensity. Both sign owners have been very cooperative with the City of Chicago and the City has advised the ATCT to immediately notify them if any issues continue to arise on this distraction. We understand ALPA may be planning to meet with AAS in the near future on this national issue…"

- **SDF Taxiway Signage, Markings and Lighting (FYI 2016-28)**
An FAA Airport Certification & Safety Inspector responded and stated "We have reviewed the problem and have determined that an additional taxiway B direction sign needs to be installed on the back of sign number H2 to facilitate aircraft taxiing from the terminal ramp to runway 17R. I have informed Mr. X who agrees with the additional signage. Our maintenance department will order and install the sign face accordingly."

- **Similar Sounding Fix Names, RUBER/ROBER (AB 2016-43)**
An FAA (AJV-5) Technical Advisor to Instrument Flight Procedures Group responded stating "I agree, the fixes are similar sounding. I have provided this information to the Eastern Service Area and asked them to select a different name for one of the fixes."

Quick Responses

Quick Response Overview

Quick Responses are rapid turnaround data analysis that are typically accomplished within two to ten business days of the request. They are a high value service directed towards safety issues with immediate operational importance. Quick Responses are generally limited to government agencies such as FAA, DOT, NTSB, NASA, and U.S. Congress.

Recent Quick Response Applications

- An Analysis of Unmanned Aerial Vehicle (UAV) Related Incidents

- An Analysis of NOTAM Related Incidents

- An Analysis of Flight Service Station Related Incidents

- An Analysis of General Aviation ADS-B Related Incidents

- An Analysis of Part 121 Similar Call Sign Related Incidents

ASRS Database

ASRS Database

- Information in the ASRS Database is available publicly. The ASRS will provide **Search Requests** to members of the aviation community. ASRS will search its database, download relevant reports, and send to requestor.

- Direct access to search de-identified reports in the ASRS database is now available through **ASRS Database Online** https://asrs.arc.nasa.gov/search/database.html

- For your convenience, selected relevant reports on several safety topics are available on the website called **ASRS Database Report Sets** https://asrs.arc.nasa.gov/search/reportsets.html

- The ASRS Database is also available and updated monthly through the FAA Aviation Safety Information Analysis and Sharing (ASIAS) website https://www.asias.faa.gov/

ASRS Database Metrics

- Since the inception of ASRS, over 7,521 **Search Requests** (SRs) have been directly provided by ASRS Research Staff to various aviation organizations and agencies, as well as individuals through December 2016

- The activity on the ASRS website for **ASRS Database Online** is over 1,536 completed queries a month

- From the ASRS website, **ASRS Database Report Sets** are downloaded on average over 5,620 times a month, Report Sets were first posted in January 2000

Search Requestors by Organization

January 2007 – December 2016

Organization	Total
FAA	196
Air Carriers	78
NASA	76
Media	64
NTSB	64
Alphabet Groups	49
Miscellaneous Safety Organizations	23
Individuals	21
Other	19

Organization	Total
Student	15
Research Organizations	14
Aircraft Manufacturers	11
Miscellaneous Government	9
Foreign	9
Law Firms	5
Military	5
Educational Institutes	4
DHS	2

Recent Search Requests Samples

- **Part 121 Runway Incursion Related Incidents (SR 7240)**
  - Completed for the NTSB

- **GPS Unreliable or Loss of Signal Related Incidents (SR 7237)**
  - Completed for the Idaho National Laboratory

- **Hot Air Balloon Events Involving Power Lines (SR7236)**
  - Completed for the NTSB

- **Solar Array Glare Related Incidents (SR 7234)**
  - Completed for the FAA (AVP-200)

CALLBACK

CALLBACK Overview

CALLBACK, the award winning ASRS monthly safety newsletter, has been published since 1979 in a popular "lessons learned" format. *CALLBACK* presents ASRS report excerpts that are significant, educational, and timely. Occasionally features on ASRS program developments and research are also presented. Over 443 issues have been published and distributed throughout the U.S. and to the international aviation community. All issues since December 1994 are available for download at the ASRS website at:

https://asrs.arc.nasa.gov/publications/callback.html

CALLBACK Distribution and Subscription

- In addition to being published online, *CALLBACK* is distributed by email. Subscription is free and available via the ASRS website.

- The total number of email subscribers for 2016 was over **28,500**

- *CALLBACK* views for 2016 (HTML and PDF) were over **379,900**
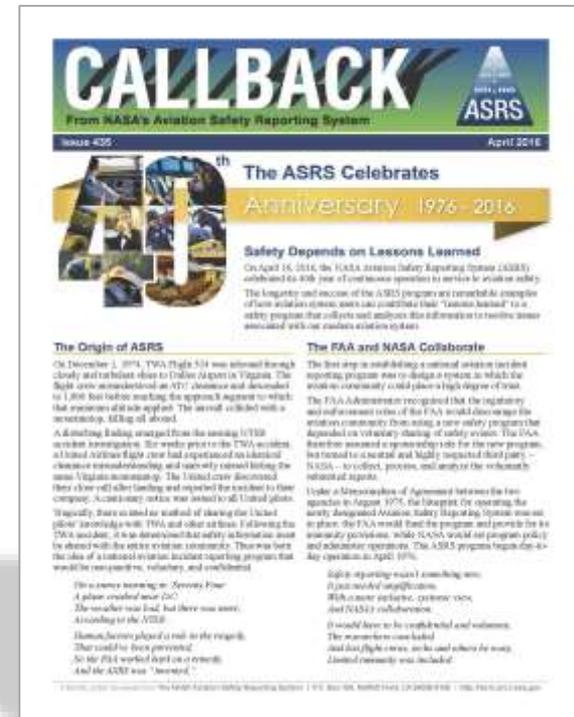
Aviation Community Feedback

Sample reader comments from 2016

"Good report on automation related errors in aviation."

"I think I have been reaching CALLBACK since the beginning. It must be one of the least expensive projects in U.S. government history.

"CALLBACK is a great teaching tool. You get to learn by others' mistakes with the hope of not making the same mistake!"

"Congratulations on forty years of ASRS and CALLBACK! A great milestone for an important publication. I am not sure how far back I go, but I always looked forward to the blue sheets arriving in the mail."

ASRS Directline

ASRS Directline Overview

ASRS Directline is another award-winning ASRS publication. Although not currently published, this safety journal had an estimated readership of 20,000. Ten issues have been published since 1991 with an average of three to five articles per issue. All issues are available for download at the ASRS website at:

https://asrs.arc.nasa.gov/publications/directline.html

The feasibility of producing this publication again in the near future is being assessed.

Focused Studies/Research

Focused on Operations and Human Factors

- 64 Research Studies and Special Papers Published
  - **Operations:** Deviations, De-Icing/Anti-Icing, Rejected Takeoffs, Clearances, Weather Encounters, Landing Incidents, Runway Transgressions, TCAS II, Crossing Restrictions, etc.
  - **Human Factors:** Communication, Memory, Confusion, Time Pressure, Judgment, Training, Crew Performance, Flight Crew Monitoring, etc.
  - **Confidential Reporting:** ASRS Reporting Model, Case for Confidential Reporting, Development of ASRS, Cross Industry Applications, etc.

- Research agendas are developed in collaboration with government and industry safety organizations

- There are over 30 ASRS Research Papers available to download on the ASRS website

Structured Callback: Supplemental Question Set

Wake Vortex Encounter Study

In cooperation with the FAA ASRS is currently examining Wake Vortex Encounter incidents reported to ASRS. ASRS began this study in 2007 and will continue through 2017. At present the Wake Vortex Encounter Study includes all airspace within the United States, enroute and terminal. In quarterly reports, the ASRS documents event dynamics and contributing factors underlying unique wake vortex encounter incidents.
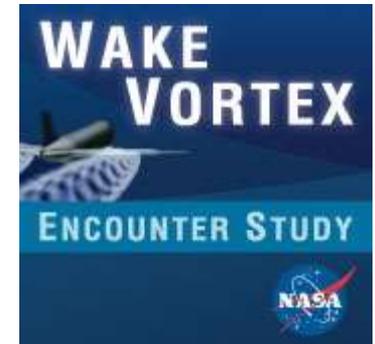
A sampling of the factors to be analyzed includes reporters' assessed magnitude of wake encounter, aircraft spacing, aircraft type, runway configuration, and consequences from the encounter.

Structured Callback: Supplemental Question Set

Meteorological and Aeronautical Information Services Data Link Services and Applications Study

Meteorological & Aeronautical Information Services Data Link Study

In cooperation with the FAA, ASRS is conducting a study focused on meteorological and aeronautical information services (AIS) via data link. ASRS is gathering reports of incidents that occurred while pilots were utilizing weather or AIS information in the cockpit (textual and/or graphical) obtained via data link (including ACARS) or other sources on the ground or in the air.

Some factors to be analyzed include type of weather data received, cockpit display utilized, software or applications used to receive meteorological information, and end user graphical interface issues. In March of 2012 an interim report was published and is now available on the ASRS website.
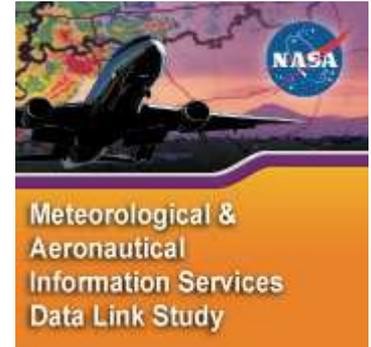
ASRS Model Applied

ASRS Model Applied

The ASRS model is utilized internationally in the aviation community. The International Confidential Aviation Safety Systems (ICASS) Group promotes confidential reporting systems as an effective method of enhancing flight safety in commercial air transport and general aviation operations.

International Civil Aviation Organization (ICAO) has revised Annex 13 – Accident Prevention and created Annex 19, Chapter 5, which addresses member states establishing a voluntary incident reporting system.

Because of the success of ASRS, there is also a growing interest in utilizing the ASRS reporting model for application to other disciplines such as medicine, railroad, maritime, security, firefighting, law enforcement, and others.

ASRS Model Applied to International Aviation Community

- **UNITED STATES:** Aviation Safety Reporting System (ASRS) [1976]

- **UNITED KINGDOM:** Confidential Human factors Incident Reporting Program (CHIRP) [1982]

- **CANADA:** Confidential Aviation Safety Reporting Program (CASRP) [1985], SECURITAS [1995]

- **AUSTRALIA:** CAIR [1988], Report Confidentially (REPCON) [2007]

- **BRAZIL:** Confidential Flight Safety Report (RCSV) [1997]

- **JAPAN:** Aviation Safety Information Network (ASI-NET) [1999], VOICES [2014]

- **FRANCE:** Confidential Events Reporting System (REC) [2000], REX [2011]

- **TAIWAN:** Taiwan Confidential Aviation Safety Reporting System (TACARE) [2000]

- **SOUTH KOREA:** Korean Aviation voluntary Incident Reporting System (KAIRS) [2000]

- **CHINA:** Sino Confidential Aviation Safety reporting System (SCASS) [2004]

- **SINGAPORE:** Singapore Confidential Aviation Incident Reporting (SINCAIR) [2004]

- **SPAIN:** Safety Occurrence Reporting System (SNS) [2007]
  Safety Reporting System – SEPLA (SRS) [2007]

- **SOUTH AFRICA:** Confidential Aviation Hazard Reporting System (CAHRS) [2013]

ASRS Model Applied to International Aviation Community

United Kingdom
CHIRP (1982)

Russia
VASRP

Japan
ASI-NET (1999)
VOICES (2014)

Canada
CASRP (1985)
SECURITAS (1995)

Germany
EUCARE

United States
ASRS (1976)

Spain
SNS/SRS (2007)

France
REC (2000)
REX (2011)

China
SCASS (2004)

South Korea
KAIRS (2000)

Taiwan
TACARE (2000)

Singapore
SINCAIR (2004)

Brazil
RCSV (1997)

South Africa
CAHRS (2013)

Australia
CAIR (1988)
REPCON (2007)

New Zealand
ICARUS

Current Members

Former Members

International Confidential Aviation Safety Systems (ICASS)   49

ASRS Model Applications

Confidential Close Call Reporting System (C3RS)

A Confidential Close Call Reporting System to improve railroad safety. C3RS is a partnership between railroad carriers, railroad labor organizations, NASA, and the Federal Railroad Administration (FRA). (2010 to present)

The National Fire Fighters Near-Miss Reporting System

The project is administered by the International Association of Fire Chiefs (IAFC) in consultation with the National Fire Fighter Near-Miss Reporting System Task Force, with the goal to improve fire fighter safety. (2005 to present)

ASRS Summary

ASRS Summary

ASRS is a highly successful and trusted program that has served the needs of the aviation community for over 40 years. It is available to all participants in the National Airspace System who wish to report safety incidents and situations.

The ASRS identifies system deficiencies, and issues alerting messages to persons in a position to correct them. It educates through its newsletter *CALLBACK*, its journal *ASRS Directline* and through its research studies. Its database is a public repository which serves the needs of the FAA and NASA, and those of other organizations world-wide which are engaged in research and the promotion of safe flight.

Advantages of the ASRS Model

- System-Wide Perspective

- System-Wide Alerting

- Data Processing through Expert Analysts

- Comprehensive and Time Tested Coding Taxonomy

- Strong Immunity and Legal Provisions

- Information Sharing on Safety/Security

- National and International Reputation

Why Confidential Reporting Works

- When organizations want to learn more about the occurrence of events, the best approach is simply to ask those involved

- People are generally willing to share their knowledge if they are assured
  - Their identities will remain protected
  - There is no disciplinary or legal consequences

- A properly constructed *confidential*, *voluntary*, *non-punitive* reporting system can be used by any person to safely share information

- Confidential reporting systems have the means to answer the question *why* - why a system failed, why a human erred

- Incident/event data are complementary to the data gathered by other monitoring systems

Thank You

- **Contact the NASA ASRS Director (Acting)**
  - Becky L. Hooey – Becky.L.Hooey@nasa.gov

- **Additional Information & Resources**

  - Confidentiality & Incentives to Report
    https://asrs.arc.nasa.gov/overview/confidentiality.html

  - Immunity Policies
    https://asrs.arc.nasa.gov/overview/immunity.html

  - Requesting ASRS Data
    https://asrs.arc.nasa.gov/search/requesting.html